The Clean Water Act in Kansas: 25 Years Later

Twenty-five years after Congress passed the Clean Water Act, we can see the effects not only on our water quality, but on our culture as well. In 1972, when the CWA was passed, there was growing national concern over an environment that was becoming more and more polluted. The Potomac and Cuyahoga Rivers were national embarrassments; Lake Erie was dying.

Although Kansas didn't have the pollution difficulties the coastal states did, it still had its share of water quality problems. Most municipal sewage provided only primary treatment, with 23 treatment plants discharging 38 million gallons per day of partially treated wastes into Kansas rivers.

Water pollution was visible; people saw streams black from discharges, colored with industrial wastes, lined with sludges from cities and industries. They saw fish kills from feedlot and industry run-off.

These visible insults to streams provided obvious goals for clean-up projects. Civic leaders, industrialists, and regulators could point to the problems, and their constituents could rally to the cause and call for a resolution to the growing problems. These forces combined under the Clean Water Act (CWA) to provide restoration and protection for the nation's streams, rivers, and lakes. The CWA provided national direction to the call for cleaner water and increased regulators' power to enforce that direction.

The CWA established national goals and directions, a permit program for discharges, minimum standards for secondary wastewater treatment, and financial aid for publicly owned treatment works.

The CWA strengthened enforcement authority and established ambitious compliance dates. States have a major role in implementing the act and may customize their programs to meet local needs, as long as they meet federal requirements. States establish water quality standards; issue permits for discharges; allocate discharges to streams; train and assist operators; inspect, enforce, sample, and analyze water quality testing; assist with financing; and manage stormwater runoff programs.

The impact on Kansas

At the 25-year anniversary of the Clean Water Act, it is appropriate to reflect on the act and the changes that have taken place in the state.

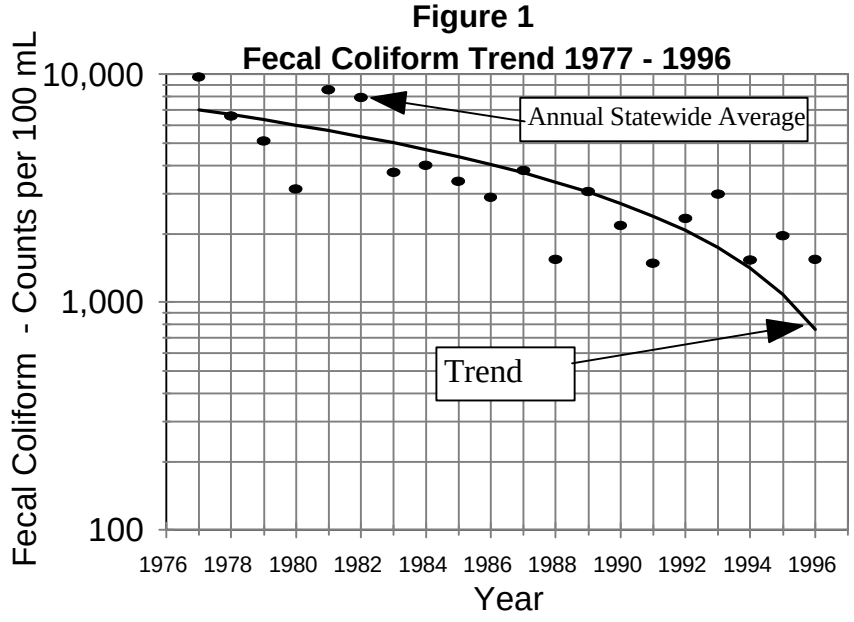
The condition of Kansas streams has improved; the amount of pollution has decreased at the same time population and industry have grown. Figures 1 and 2 show the results from all monitoring stations through-out Kansas. Both fecal coliform and ammonia are found to be generally one-tenth of the 1976 levels.

CWA success stories can be found in every community, as each was affected by permits and construction grants. The following examples show significant progress has been made in the state's water quality.

Arkansas River. Improved wastewater treatment plants, especially at Wichita and Hutchinson, have had an obvious improvement on the river. These improvements include dramatic decreases in ammonia levels, metals, and bacteria. Before the treatment plants were upgraded, discharges significantly impacted the Arkansas River, darkening it with inadequately treated sewage at Hutchinson. Below Wichita, more sensitive fish species have returned.

As Figure 3 shows, total ammonia concentration below Wichita has dropped and remained below the level needed to support life. In addition, fecal coliform has dropped, from peaks of 500,000 per 100 milliliter of water to around 100. White bass can be observed feeding on smaller fish at the treatment

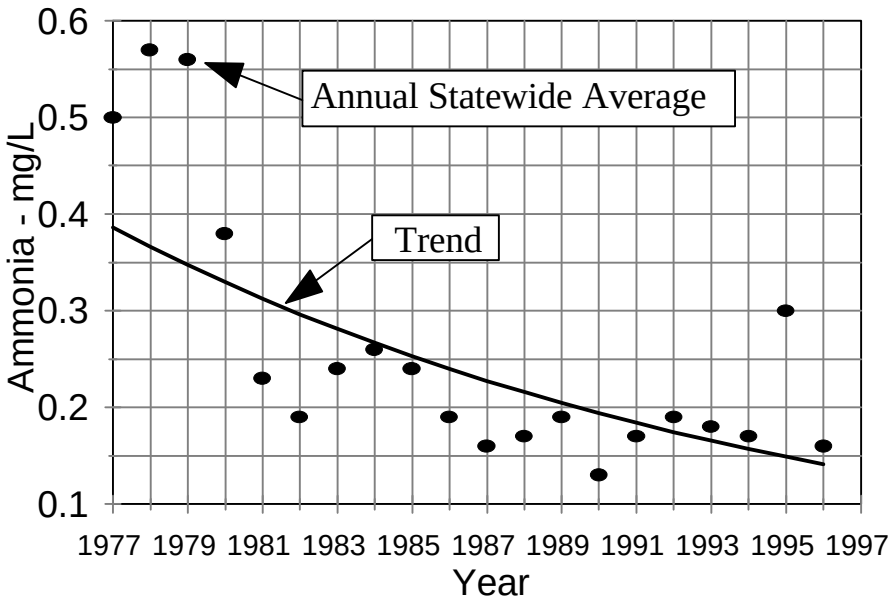
Figure 1
Fecal Coliform Trend 1977 - 1996



plant's discharge. Prior to the upgrade, only more pollution-tolerant fish species were found downstream, and none was found in the vicinity of the plant discharge.

Big Creek. Hays upgraded the city wastewater plant and provided advanced secondary treatment including nitrification, denitrification, disinfection, and filtration. These more advanced treatment processes were added to allow parks and golf courses to reuse the effluent, and for potential potable use. Before the plant upgrade, Big Creek had been stressed with high ammonia levels, bacteria, and low dissolved oxygen (see Figure 4). These stressors have been eliminated with dramatic reductions in pollutants and the return of a diverse biological community.

Figure 2
Ammonia 1977 - 1996



Regional Wastewater Collection and Treatment. Suburban growth can spawn small sewage treatment plants that soon become so overloaded they can't provide the treatment level needed to protect receiving streams. Several major regional wastewater systems have been installed under the Clean Water Act's programs. These more efficient regional systems eliminate the discharges to the small urban streams, improving the stream's quality, protecting public health, and allowing development to continue with less impact on urban streams. Examples of very successful regional systems include:

Johnson County Mill Creek. This regional sewer system eliminated seven treatment plants discharging to Mill Creek and its tributaries. It provided sewage collection for the 60-square-mile Mill Creek basin through 16 miles of interceptor sewers and supplied initial treatment capacity for 90,000 people with expansion capability. These seven treatment plants were at or over their design capacity, and their discharges formed the base flow of Mill and Little Mill Creeks. These discharges have been eliminated.

Sedgwick County Four Mile Creek. Construction of a regional sewer system eliminated four small treatment plants and provided capacity for improved wastewater treatment for 10,000 people, with expansion capabilities.

Shawnee County Half Day Creek. Development of a regional system will eliminate four small treatment plants and allow the entire basin to be connected to Topeka's treatment plant.

Installation of Sanitary Sewers. About 110 sanitary sewer systems have been built throughout the state, replacing inadequate individual treatment systems such as failing septic systems. The failing systems were a public health threat, with sewage accumulating in yards, ditches, and streams. Through the act's federal funds, 43,000 Kansans have been provided sewer systems.

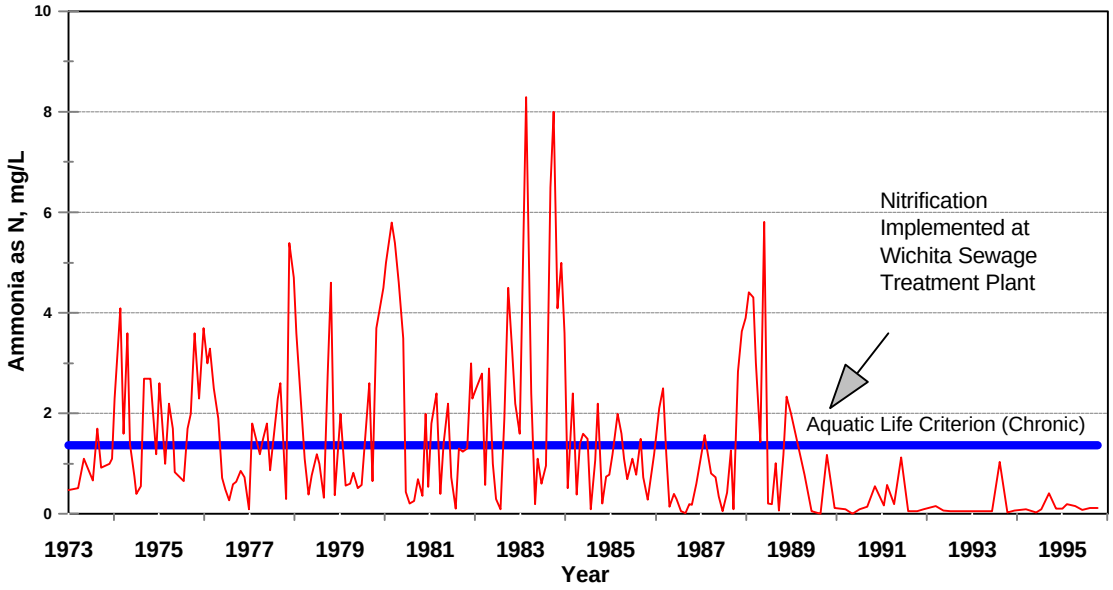
Smoky Hill River below Salina. The largest public works project in Salina's history was upgrading the sewage treatment plant. The new plant has eliminated the levels of bacteria, ammonia, and toxicity that previously violated state standards below the discharge (see Figure 5), and biological indicators below Salina have been returned to those expected when there are no discharges. Dense growths of algae that previously choked the stream have been eliminated.

Walnut River. Through improved controls on refinery, municipal and oil field wastes, this stream can again be used as a water supply source by Arkansas City. Before the act, the stream's high fluoride and organic chemical levels prevented its use as a drinking water source.

Animal Feeding Facility Controls. Kansas is a national leader in the livestock feeding industry and pioneered large cattle feeding facilities. While this industry has grown, water pollution controls have kept pace, partially due to the permit program. Feeders are required to control the storm runoff from their facilities and use the wastewater for irrigation and fertilizer.

Figure 3

ARKANSAS RIVER AT DERBY
TOTAL AMMONIA CONCENTRATION



ARKANSAS RIVER AT DERBY
FECAL COLIFORM BACTERIA CONCENTRATION (RUNNING FIVE-SAMPLE GEOMETRIC MEAN)

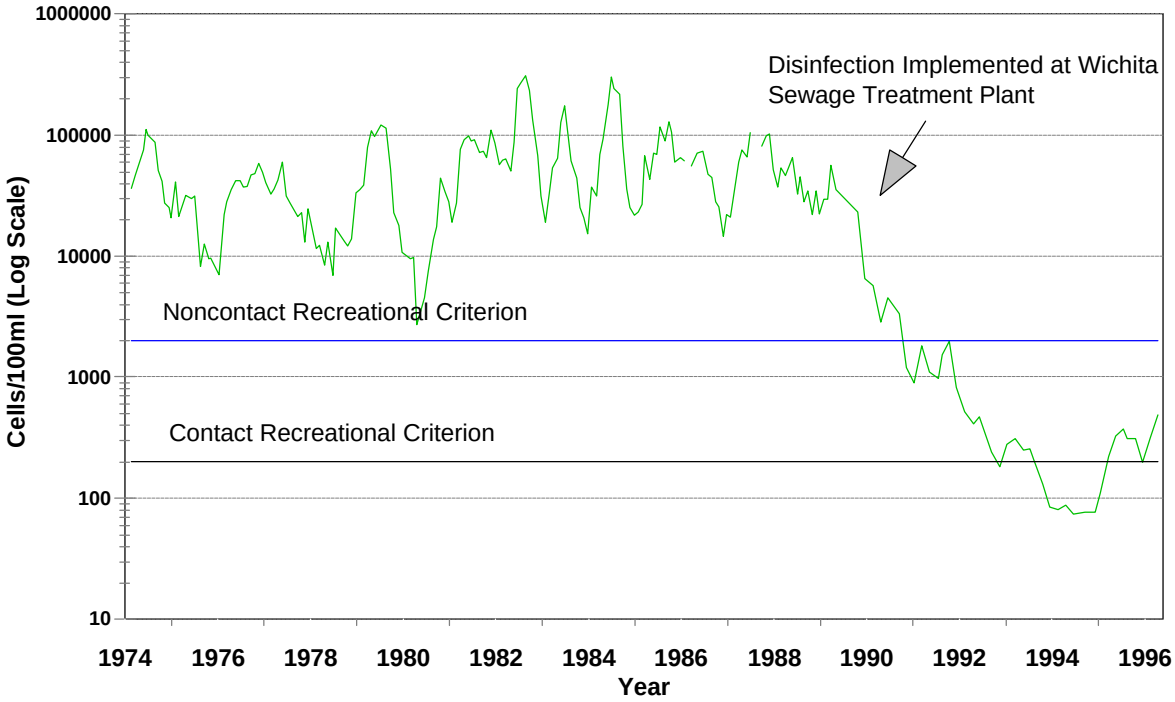
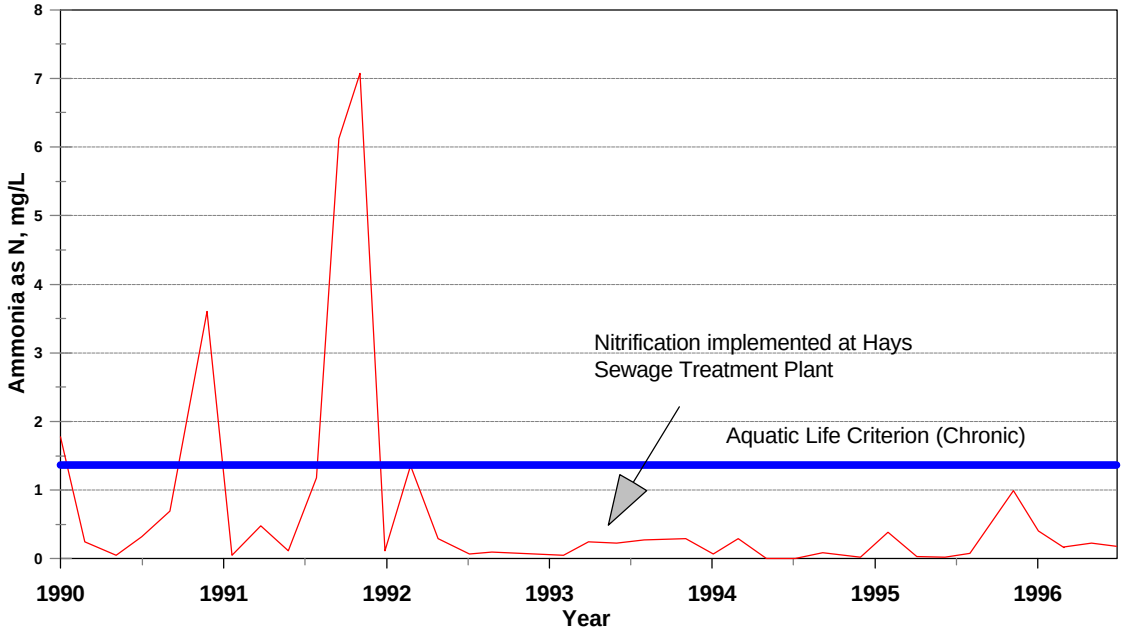


Figure 4

BIG CREEK NEAR MUNJOR
TOTAL AMMONIA CONCENTRATION



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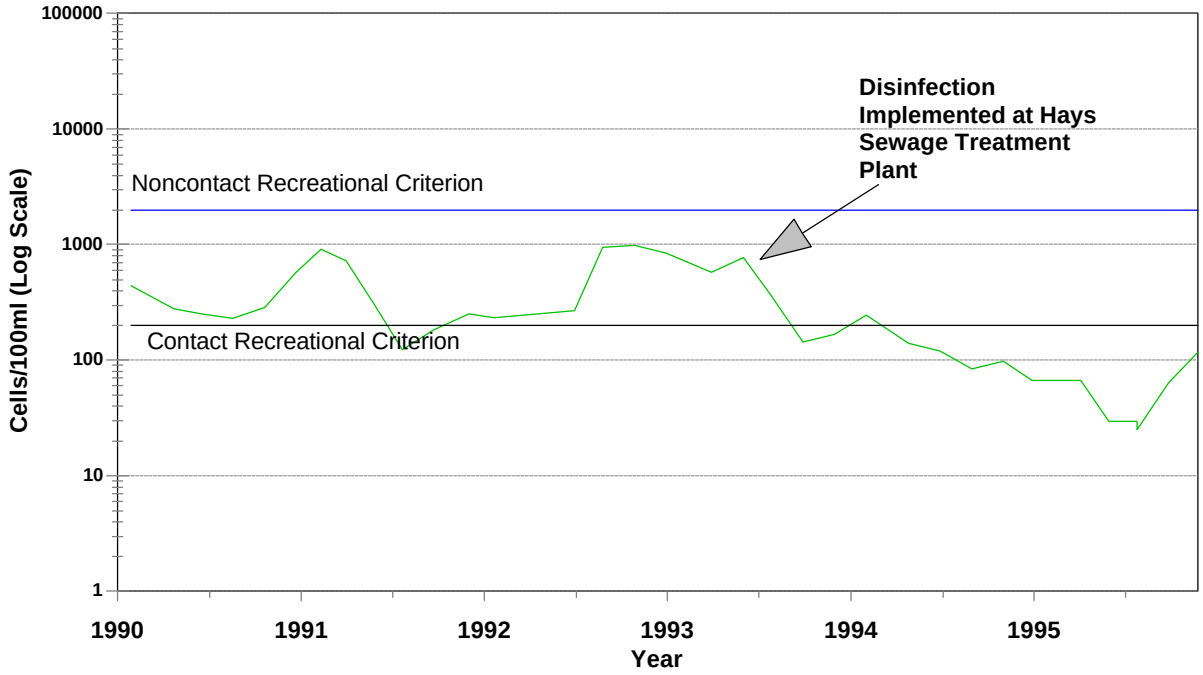

Local Wastewater Control Infrastructure. Municipalities and industries have developed significant pollution control infrastructures, both physical and managerial. This managerial infrastructure is composed of public works personnel, chemists, biologists, engineers, scientists, operations personnel, finance experts, and environmental managers who design, construct, and run the treatment plants and implement water quality programs. This cadre of specialists did not exist in this number or level of expertise prior to the act.

Kansas Management Infrastructure. Kansas has developed an effective and extensive water quality program composed of scientists, engineers, and technicians. KDHE maintains a comprehensive water monitoring program to evaluate water quality and guide programs. This program provides chemical, radiological, and biological data about water quality, fish tissue, and biological indices.

Salt Plants. Kansas salt plants at Lyons and Hutchinson have developed pollution control programs to minimize the salt discharged. Prior to the act, process wastes were routinely discharged, and product spills and broken blocks and bags were washed into the plant discharge sewers.

Basic changes in process controls, brine handling, spill containment, and control systems have been combined with roofed loading docks and improved practices to reduce the tons per day of chloride discharged from over 60 tons per day down to a level nearly matching the area's background levels.

Meat Processors. Kansas' beef processing industry has increased its kill capacity from approximately 6,000/day in 1972 to 28,000 in 1997. While production more than quadrupled in 25 years, the amount of pollutants discharged has been reduced. Only one major beef processor in the state now discharges wastewater to a river. The remaining four large processors in Southwest Kansas manage wastewater with non-overflowing systems.

Construction Grants. Grants available under the CWA are responsible for much of the municipal infrastructure protecting Kansas waters. Under the act, KDHE processed $463 million in grants for about 500 projects.

These grants were for a percentage, generally 50 to 75 percent, of the eligible project cost; local governments picked up the difference and often further improvements. These grants typically were used for construction of treatment works, sewers, planning, engineering, and administration. Kansas and other states established a priority system to identify which projects would yield the best water quality benefits. This priority system has driven the program's management and the loan program, which replaced grants. KDHE estimates the municipal wastewater construction spurred by the grants program at more than $1 billion in capital.

Revolving Loan Fund. The act authorized Kansas to establish a revolving loan fund. Through the summer of 1997, KDHE made $205 million in loans to 85 municipalities to assist in construction of wastewater collection and treatment systems. Under the act, EPA provided KDHE a capitalization grant to which the state provides at least a 20 percent match. Kansas has provided more than the minimum match, which has allowed the fund to help more communities. Loans have ranged from $60,000 for Edna, population 456, to $50 million to Johnson County.

Nonpoint Source Pollution Control. The act provides demonstration grants for control of non-point sources of pollution, that is, water pollution from sources not discharging through pipes. This includes runoff from urbanized areas, agriculture, construction areas, and natural sources. Common water quality problems include elevated levels of sediments, nutrients, bacteria, pesticides, and changes to the stream flowpath. Using funds from the Act, Kansas communities have initiated more than 70 nonpoint source demonstration projects. A few of the more notable include:

Cheney Lake. A cooperative local effort to implement pollution controls in the recreation drainage basin of a federal reservoir providing drinking water for the city of Wichita.

Sand Springs. Technical and financial assistance to support local efforts to develop water quality protection measures to reduce the high nitrate in the source of Abilene's drinking water.

Herrington Lake. Herrington's drinking water supply was threatened by livestock pollution runoff. Through a partnership of the Dickinson County Conservation District, Kansas State Extension, and KDHE, 11 livestock producers voluntarily implemented protection measures. In addition to the specific projects mentioned above:

Water Plan.
The state water plan has annually dedicated more than $8 million to nonpoint source projects through targeted state programs.

Volunteer Efforts. Citizens are more aware of our society's impacts on water quality, and individual involvement in clean up and protection efforts is more common. The act has funded demonstration projects by local groups and private citizens to show how various management practices affect water quality.

Looking to the future

In 1972, the primary emphasis was

on eliminating major, visible cases of pollution, and pollution was measured in parts per million. In 1987 the Act was revised with emphasis on control of toxins, nonpoint sources, and conversion of the municipal grants program to loans.

Issues which being discussed in the reauthorization process include:

Nonpoint Pollution. How does the nation want to further address this issue? Should controls or improvements be voluntary or mandatory? Should more funds be directed at the issue?

State Funding. States, which implement most of the act's provisions, have reduced funding for water programs leaving some requirements unmet.

Antidegradation. This provision of the Act is often debated and implemented in varying fashions. National policy clarification is anticipated.

The Clean Water Act in Kansas: 25 Years Later. Produced by the Kansas Department of Health and Environment, Bureau of Water and Office of Public Information. The Bureau of Water's central offices are in Topeka at Building 283, Forbes Field, 785-296-5500. KDHE has district offices in Salina, Lawrence, Hays, Wichita, Chanute, Dodge City, and Ulysses. Produced October 1997 by the Office of Public Information. Pks. Publication Number ZC8012.